DETAILED ACTION

Election/Restrictions

1. Restriction is required under 35 U.S.C. 121 and 372. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-20, drawn to a process.

Group II, claim(s) 21-27, drawn to a polymeric part.

2. The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features. The special technical feature is a first mixture of polymer and hydrocarbon formed into a planar sheet and thermoformed in a mold coated with mineral oil and wax. However, this special technical feature is anticipated by Grancio and Coscia. Grancio teaches thermoforming of a polymer blend that may contain a thermoplastic styrenic block copolymer and a hydrocarbon mixture (polyethylene and/or mineral oil, Abstract and 3:50). Grancio is silent to the mineral oil and wax on the mold. However, Coscia teaches providing a mineral oil (2:8-10) and polyethylene which can dissolve in the mineral oil, interpreted to be a wax, and applying the mixture to a mold which could be used for molding synthetic resins (3:28-35) such as those of Grancio. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the mold release of Coscia into the molding process of Grancio because (a) Coscia specifically suggests the mold release for molding synthetic resins,

or (b) the Coscia reference teaches an improvement which one would obviously have incorporate into the Grancio process in order to provide the same improvements (easy release from a mold).

3. Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct and there would be a serious search and examination burden if restriction were not required because one or more of the following reasons apply:

(a) the inventions have acquired a separate status in the art in view of their different classification;

(b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

(d) the prior art applicable to one invention would not likely be applicable to another invention;

(e) the inventions are likely to raise different non-prior art issues under 35 U.S.C. 101 and/or 35 U.S.C. 112, first paragraph.

4. **Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined** even though the requirement may be traversed (37 CFR 1.143) **and (ii) identification of the claims encompassing the elected invention**.

5. The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an

election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable on the elected invention.

6. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

7. During a telephone conversation with Mr. Sosenko on 5 January 2010 a provisional election was made with traverse to prosecute the invention of Group I, claims 1-20. Affirmation of this election must be made by applicant in replying to this Office action. Claims 21-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Rejections over Grancio

8. **Claims 1 and 2** are rejected under 35 U.S.C. 103(a) as being unpatentable over Grancio (US 4,386,188) in view of Coscia (US 3,424,607). **As to Claim 1**, Grancio teaches extruding (9:50-55) and thermoforming (9:63) of a polymer blend that may contain a thermoplastic

styrenic block copolymer and a hydrocarbon mixture (polyethylene and/or mineral oil, Abstract and 3:50), which meets the claimed first compound Grancio is silent to the mineral oil and wax on the mold. However, Coscia teaches providing a mineral oil (2:8-10) and polyethylene, interpreted to be a wax, which can dissolve in the mineral oil, and applying the mixture to a mold which could be used for molding synthetic resins (3:28-35) such as those of Grancio. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the mold release of Coscia into the molding process of Grancio because (a) Coscia specifically suggests the mold release for molding synthetic resins, or (b) the Coscia reference teaches an improvement which one would obviously have incorporate into the Grancio process in order to provide the same improvements (easy release from a mold). **As to Claim 2**, Grancio teaches polyethylene (3:65-4:16) and mineral oil (3:50).

Rejections over Mitten

9. **Claims 1-3, 6-8, 11-13, and 16-18** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitten (US 2002/0182352 A1) in view of Dawes (US 4,485,062) and Payne (US 5,399,310). With regard to **claims 1 and 11**, Mitten teach formulating a mixture of a polymer, extruding a substantially planar sheet (abstract), applying a polyester film (paragraph 0040 and 0051, polyester) and thermoforming the mixture (abstract).

Mitten is silent to the second mixture wax and mineral oil, coating the second mixture on the mold, and the hydrocarbon mixture in the first mixture.

However, Payne suggests using wax and mineral oil on a mold as a release agent (column 1, lines 14 to 40), equivalent to the claimed second mixture.. At the time of the invention, it

would have been obvious to a person of ordinary skill in the art to apply wax and mineral oil to the mold taught by Mitten. The motivation to do so would have been to enable easy release of the molded part and leave no visible surface defects on the molded part (Payne, column 1, lines 32-34).

Additionally, Dawes teaches forming a first mixture of a polymer and a hydrocarbon mixture (column 5, lines 15-28). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to incorporate a hydrocarbon mixture into the polymer taught by Mitten. The motivation to do so would have been to reduce die pressure to obtain a smooth polymeric extrudate at a higher rate of extrusion (Dawes, column 6, lines 11-14).

With regard to **claims 2 and 12**, Dawes teaches that the first mix includes mixing a mineral oil and a wax to form a hydrocarbon mixture (column 5, lines 15-16).

With regard to **claims 3 and 13**, Dawes suggests that the choice of the low viscosity liquid is dependant on the desired effects on the properties of the polymer extrudate (column 5, lines 23-35). Therefore, it would be obvious to choose any combination and proportion of known ingredients including a 50/50 mix by weight of mineral oil and wax as a matter of routine experimentation.

With regard to **claims 6, 7, 16, and 17**, Dawes teaches adding a hydrocarbon having a concentration of 1-5% of the weight of the extrudate (column 5, lines 1-4). This range overlaps the claimed range of between 1 parts per million to 5% by weight of the polymer.

With regard to **claims 8 and 18**, Dawes teaches that the polymer is a polyolefin (column 4, lines 8-13).

10. **Claims 4, 5, 14, and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitten (US 2002/0182352 A1) in view of Dawes (US 4,485,062) and Payne (US 5,399,310), and further in view of Smith (US 3,484,507). Mitten, Dawes, and Payne teach the subject matter of claims 1 and 11 above under 35 USC 103(a).

With regard to **claim 4**, Mitten in view of Dawes and Payne teach the invention of claim 1 as discussed above, but do not explicitly teach that the hydrocarbon mixture has a melting point between 25 to 65 degrees C. Smith teaches a mixture of wax and mineral oil with a melting temperature between 40 and 90 degrees C (column 4, lines 36-43). This range overlaps and thus teaches the claimed range.

With regard to **claim 5**, Mitten in view of Dawes and Payne teach the invention of claim 4 as discussed above, but do not explicitly teach that the hydrocarbon mixture has a melting point between 35 to 50 degrees C. Smith teaches a mixture of wax and mineral oil with a melting temperature between 40 and 90 degrees C (column 4, lines 36-43). This range overlaps and thus teaches the claimed range.

With regard to **claim 14**, Mitten in view of Dawes and Payne teach the invention of claim 11 as discussed above, but do not explicitly teach that the hydrocarbon mixture has a melting point between 25 to 65 degrees C. Smith teaches a mixture of wax and mineral oil with a melting temperature between 40 and 90 degrees C (column 4, lines 36-43). This range overlaps and thus teaches the claimed range.

With regard to **claim 15**, Mitten in view of Dawes and Payne teach the invention of claim 14 as discussed above, but do not explicitly teach that the hydrocarbon mixture has a melting point between 35 to 50 degrees C. Smith teaches a mixture of wax and mineral oil with

a melting temperature between 40 and 90 degrees C (column 4, lines 36-43). This range overlaps and thus teaches the claimed range.

11. **Claims 9, 10, 19 and 20** are rejected under 35 U.S.C. 103(a) as being unpatentable over Mitten (US 2002/0182352 A1) in view of Dawes (US 4,485,062) and Payne (US 5,399,310), and further in view of Knoll (US 4,948,355). Mitten, Dawes, and Payne teach the subject matter of claims 1 and 11 above under 35 USC 103(a).

With regard to **claim 9**, Mitten in view of Dawes and Payne teach the invention of claim 1, but do not explicitly teach heating the mold to a temperature of at least 140 degrees F. Knoll teaches thermoforming a polymer by heating a mold to a temperature of 560 to 580 degrees F (column 12, lines 20-24). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to heat the mold to a temperature of greater than 140 degrees F. The motivation to do so would have been to shape the polymer sheet. Furthermore, it is well known in the art to adjust the temperature of molds used for thermoforming polymers depending on the melting temperature and thickness of the polymer sheet to be formed.

With regard to **claim 10**, Mitten in view of Dawes and Payne teach the invention of claim 1, but do not explicitly teach heating the mold to a temperature of at least 750 degrees F and pressing for at least 40 seconds. Knoll teaches thermoforming a polymer by heating a mold to a temperature of 750 degrees F (column 8, lines 69-54) and pressing for 30 minutes (column 12, lines 20-23). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to heat the mold to a temperature of greater than 750 degrees F and to press for longer than 40 seconds. The motivation to do so would have been to shape the polymer sheet.

Furthermore, it is well known in the art to adjust the temperature and time held of the molds used for thermoforming polymers depending on the melting temperature and thickness of the polymer sheet to be formed.

With regard to **claim 19**, Mitten in view of Dawes and Payne teach the invention of claim 18, but do not explicitly teach heating the mold to a temperature of at least 140 degrees F. Knoll teaches thermoforming a polymer by heating a mold to a temperature of 560 to 580 degrees F (column 12, lines 20-24). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to heat the mold to a temperature of greater than 140 degrees F. The motivation to do so would have been to shape the polymer sheet. Furthermore, it is well known in the art to adjust the temperature of molds used for thermoforming polymers depending on the melting temperature and thickness of the polymer sheet to be formed.

With regard to **claim 20**, Mitten in view of Dawes and Payne teach the invention of claim 18, but do not explicitly teach heating the mold to a temperature of at least 750 degrees F and pressing for at least 40 seconds. Knoll teaches thermoforming a polymer by heating a mold to a temperature of 750 degrees F (column 8, lines 69-54) and pressing for 30 minutes (column 12, lines 20-23). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to heat the mold to a temperature of greater than 750 degrees F and to press for longer than 40 seconds. The motivation to do so would have been to shape the polymer sheet. Furthermore, it is well known in the art to adjust the temperature and time held of the molds used for thermoforming polymers depending on the melting temperature and thickness of the polymer sheet to be formed.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW J. DANIELS whose telephone number is (571)272-2450. The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew J. Daniels/
Primary Examiner, Art Unit 1791
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